

Amendment After Final Office Action
U.S. Patent Application No. 10/019,474

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-57. (Canceled)

58. (Previously Presented) A method for the production of a natural gas hydrate characterised by the steps of:

pre-mixing natural gas and water and an agent adapted to reduce the natural gas-water interfacial tension to form a natural-gas water-agent system;

allowing the natural gas-water-agent system to reach equilibrium at elevated pressure and ambient temperature; and,

after the natural gas-water-agent system has reached equilibrium at elevated pressure and ambient temperature, reducing the temperature of the natural gas-water-agent system to initiate the formation of the natural gas hydrate.

59. (Previously Presented) A method according to claim 58 characterised by the additional step of, before pre-mixing natural gas and water and the agent adapted to reduce interfacial tension, atomising the natural gas and water.

60. (Previously Presented) A method according to claim 58 characterised by the natural gas-water-agent system being agitated before the temperature is reduced.

61. (Previously Presented) A method according to claim 58 characterised in that the agent is a compound that is at least partially soluble in water.

62. (Previously Presented) A method according to claim 61 characterised in that the agent is an alkali metal alkylsulfonate.

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63. (Previously Presented) A method according to claim 61 characterised in that the agent is a sodium alkylsulfonate.

64. (Previously Presented) A method according to claim 61 characterised in that the agent is selected from the group consisting of sodium lauryl sulfate, sodium 1-propanesulfonate, sodium 1-butane sulfonate, sodium 1-pentanesulfonate, sodium 1-hexane sulfonate, sodium 1-heptane sulfonate, sodium 1-octanesulfonate, sodium 1-nonanesulfonate, sodium 1-decanesulfonate, sodium 1-undecanesulfonate, sodium 1-dodecanesulfonate and sodium 1-tridecane sulfonate.

65. (Previously Presented) A method according to claim 61 characterised in that the amount of agent added is such that the concentration of the agent in the natural gas-water-agent system is less than about 1% by weight.

66. (Previously Presented) A method according to claim 61 characterised in that the amount of agent added results in a concentration of the agent less than about 0.5% by weight.

67. (Previously Presented) A method according to claim 61 characterised in that the amount of agent added results in a concentration of the agent between about 0.1 and 0.2% by weight.

68. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium lauryl sulfate.

69. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium lauryl sulfate and the amount of agent added is preferably such that the concentration of the agent in the natural gas-water-agent system is less than about 1% by weight.

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70. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium lauryl sulfate and the amount of agent added results in a concentration of the agent less than about 0.5% by weight.

71. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium lauryl sulfate and the amount of agent added results in a concentration of the agent between about 0.1 and 0.2% by weight.

72. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium tripolyphosphate.

73. (Previously Presented) A method according to claim 61 characterised in that the agent is sodium tripolyphosphate and the amount of agent added is preferably such that the concentration of the agent in the natural gas-water-agent system is between about 1 and 3% by weight.

74. (Previously Presented) A method according to claim 61 characterised in that the agent is an alcohol.

75. (Previously Presented) A method according to claim 61 characterised in that the agent is isopropyl alcohol.

76. (Previously Presented) A method according to claim 61 characterised in that the agent is isopropyl alcohol and the amount of agent added is preferably such that the concentration of the agent in the natural gas-water-agent system is about 0.1% by volume.

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77. (Previously Presented) A method according to claim 58 characterised in that the pressure exceeds about 50 bars.

78. (Previously Presented) A method according to claim 58 characterised in that the temperature is below about 18°C.

79. (Previously Presented) A method according to claim 58 wherein the natural gas-water-agent system is constantly mixed throughout the method.